

**CLAIMS**

1. A sheet identifiable by near infrared spectroscopy, which includes at least one NIR component sensitive to radiation in the near infrared, and qualifiable and/or quantifiable by near infrared spectroscopy using a specific calibration.
2. The sheet as claimed in the preceding claim, characterized in that it includes said NIR component in one or more predetermined quantities, said NIR component being a marker having specific absorption properties in the near infrared.
3. The sheet as claimed in either of the preceding claims, characterized in that it includes at least two different NIR components sensitive to radiation in the near infrared, said components being present in respective amounts and in a ratio such that their respective spectroscopic properties in the near infrared are concealed within the spectrum of said sheet obtained by spectroscopy in the near infrared, said components being qualifiable and/or quantifiable using said calibration, especially by their respective quantities and/or ratio and/or respective or relative distributions.
4. The sheet as claimed in one of claims 1 to 3, characterized in that said NIR components are chosen from the usual pigment fillers used in cellulose or synthetic paper, preferably from silica oxides, in particular talc or kaolin, from carbonates and from synthetic organic polymers or blends thereof.
5. The sheet as claimed in one of the preceding claims, characterized in that the sheet is a

fibrous sheet based on cotton and/or cellulose and/or synthetic fibers.

- 5     6.    The sheet as claimed in the preceding claim, characterized in that said sheet is a sheet of paper.
- 10    7.    The sheet as claimed in one of claims 1 to 4, characterized in that the sheet is a nonfibrous sheet or plastic film, particularly based on one or more polyolefins.
- 15    8.    The sheet as claimed in one of the preceding claims, characterized in that at least one of said NIR components is at least partly integrated into said sheet.
- 20    9.    The sheet as claimed in the preceding claim, characterized in that said NIR component is integrated within the thickness with the base compounds of said sheet.
- 25    10.   The sheet as claimed in one of the preceding claims, characterized in that said NIR component is fixed by chemical bonding to a base compound of said sheet.
- 30    11.   The sheet as claimed in one of the preceding claims, characterized in that at least one of said NIR components is placed in and/or on a so-called security element, such as a thread, a strip or a fiber, and said element is at least partly integrated into the sheet.
- 35    12.   The sheet as claimed in claims 5 and 10 or claim 11, characterized in that said NIR component is fixed by chemical bonding to one or more cotton fibers.

13. The sheet as claimed in one of the preceding claims, characterized in that the sheet includes a "variable distribution" region within which at least one NIR component sensitive to near infrared is distributed in a variable manner.
14. The sheet as claimed in claim 13, characterized in that said region is a watermarked region or a region associated with the nonuniformity of formation of the sheet.
15. The sheet as claimed in either of claims 13 and 14, characterized in that said variable distribution region is in the form of a code.
16. The sheet as claimed in claim 15, characterized in that said code is in the form of a pattern with an alternation of regions of reduced thickness and regions of thickness greater than or equal to the thickness of the rest of the sheet, especially a watermarked barcode.
17. A security document, characterized in that it comprises a sheet as claimed in one of the preceding claims.
18. The document as claimed in the preceding claim, characterized in that it is a banknote.
19. A method of authenticating a sheet as described in claims 1 to 16 that includes at least one NIR component sensitive in the near infrared, preferably at least two NIR components, in which method:
- at least one region of said sheet that includes said NIR component(s) is exposed to radiation emitted in the near infrared;
  - the spectral data thus acquired is recorded;

5       - said NIR component(s) is qualified and/or  
quantified by analyzing the near infrared spectrum  
thus obtained using a specific calibration held  
secret and rigorously preestablished on the basis  
of measurements carried out for sheets that  
include said NIR component or, as the case may be,  
various mixtures of said NIR components, which are  
fully defined by their quantities and/or ratios;

10       - the data resulting from the spectroscopic  
analysis thus determined is compared with the  
original data stored in a database; and

15       - the authenticity of said sheet is validated  
if the data resulting from the analysis is equal  
to the original data.

20       20. The authentication method as claimed in claim 19,  
characterized in that the spectral data is  
acquired and analyzed by Fourier transform near  
infrared spectroscopy.

20       21. The authentication method as claimed in either of  
claims 19 and 20 and for a sheet that includes a  
variable distribution region as described in  
claims 13 to 16, said region exposed to the near  
25       infrared radiation being this region.

22. The authentication method as claimed in claim 21,  
characterized in that the spectral data from said  
variable distribution region is acquired by  
30       transmission or by transreflection.

23. The method as claimed in either of claims 21 and  
22, characterized in that the spectroscopic image  
in the near infrared of said variable distribution  
35       region is reconstructed using suitable software  
from the data resulting from the spectroscopic  
analysis and this image is compared with the  
original image of said region stored in a database  
so as to validate the authenticity of the sheet.

24. The method as claimed in one of claims 21 to 23,  
characterized in that said variable distribution  
region of the sheet is a watermarked region, in  
5 particular a watermark in the form of a barcode.
25. The method as claimed in one of claims 21 to 23,  
characterized in that said variable distribution  
region is a region associated with the  
10 nonuniformity of formation of the sheet, said  
region being identified with or corresponding to  
the entire sheet.
26. The authentication method as claimed in one of  
15 claims 19 to 25, applied to the authentication of  
the documents described in either of claims 17 and  
18.